

## NOTES ON AUSTRALIAN COREOPSISIDINAE (COMPOSITAE)

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## Summary

The only published description of *Glossogyne orthochaeta* F. Muell. (Compositae) is based on fruiting material; a more complete one is given here. The species is transferred to *Glossocardia* Cass. and the new combination *Glossocardia orthochaeta* (F. Muell.) Veldk. is made for it. A key to it and related species is added. Additional collections of some rare species have been found and are noted.

## Introduction

Since the publication of Veldkamp and Kreffer (1991) on the South-east Asian and Australian Coreopsidinae, the senior author has had the opportunity to visit some Australian herbaria (CANB, CBG, NSW) to examine additional material, through grants from the Australian National University, Canberra, and the Dutch Scientific Research Organization 'Nederlands Wetenschappelijk Onderzoek', which are hereby gratefully acknowledged.

This group of taxa is especially interesting for the presence of a Kranz anatomy. Notable also is the change in colour of water when leaves or capitula are boiled in it: it turns golden, red, or purple, and the leafblades and capitula of the same plant do not necessarily produce the same colour. Some kind of oil seems present. Collectors have also noted the presence of fragrance in stem, leaves, and capitula ('flowers').

The identity of *Glossogyne orthochaeta* F. Muell. was established by the examination of an additional collection found in NSW and inspection of the holotype of the combination from MEL, kindly sent on loan by Dr. J.H. Ross. It turned out to be a species of *Glossocardia*, apparently very rare although with its large yellow capitula and radiate habit most likely a conspicuous plant in the field.

Brief diagnostic descriptions are given below for the other species of this subtribe; more extensive ones with more literature references and notes can be found in Veldkamp and Kreffer (1991).

## Key to Australian Taxa of Coreopsidinae

1. Cauline leaves alternate, sometimes closely imbricate, pinnatifid to pinnatisect; capitula radiate; disc florets 4-merous; achenes lanceolate in outline, dark brown to black, ribbed, not winged . . . . . 2
  - Cauline leaves opposite, simple; capitula discoid; disc florets 5-merous; achenes obovoid in outline, concave, yellowish brown, broadly winged, not ribbed . . . . . 1. *Diodontium filifolium*
2. Ray florets 3-lobulate; achenes with longitudinal ribs only; awns 2 . . . . . 3
  - Ray florets 2-lobulate; achenes also with many warty, transverse ridges; awns 3 or 4 . . . . . 5. *Trioncinia retroflexa*
3. Achenes more or less straight, awns usually straight . . . . . 4
  - Achenes adaxially strongly involute, awns strongly reflexed . . . . . 4. *Glossocardia refracta*
4. Leaves mainly basal; capitula 5-8 mm diameter; involucre bracts straight; ray florets 5-12, rays up to 5 mm long . . . . . 2. *Glossocardia bidens*
  - Cauline leaves numerous (basal ones unknown), close-set, densely imbricate; capitula c. 50 mm diameter; involucre bracts transversally folded, reflexed against the peduncle in fruit; ray florets c. 17, c. 15 mm long . . . . . 3. *Glossocardia orthochaeta*

**1. *Diodontium filifolium*** F. Muell. in Hooker's J. Bot. Kew Gard. Misc. 9: 19 (1857); *Glossogyne filifolia* (F. Muell.) F. Muell. ex Benth., Fl. austral. 3: 544 (1866). **Type:** Australia, Northern Territory, sources of Hooker's Creek, between Sturt Creek and Victoria River, *F. v. Mueller* s.n. (holo, MEL; iso: K).

Base not seen. Cauline leaves opposite and close-set at the base of the branches. Blades simple, linear, up to 8 cm × 0.75 mm. Capitula discoid, up to 7 mm diameter. Involucral bracts straight. Disc florets 3–10, 5-merous. Achenes obovoid in outline, broadly winged when mature, concave, smooth, not ribbed, yellowish brown; awns 2, straight.

**Additional collections examined:** Northern Territory, 9 km SE of Mountain Valley H.S., c. 14°S, 134°E, Nelson 219 (NSW); 17 miles N of Helen Springs Station, Perry 1921 (CANB,NT).

**Distribution and habitat:** Australia, Northern Territory. Grows on granite hills, sandstone tableland, grassy flats near watercourses.

**Collector's notes:** Bush, strongly smelling, flowers white or yellow. Achenes shiny with yellow wings.

**2. *Glossocardia bidens*** (Retz.) Veldk., Blumea 35: 468 (1991); *Zinnia bidens* Retz., Observ. bot. 5: 28 (1788); *Glossogyne pinnatifida* DC. ex Wight, Contr. bot. India: 19 (1834), nom. superfl.; *Glossogyne bidens* (Retz.) Alston in Trimen, Handb. fl. Ceylon 6, Suppl.: 168 (1931); *Neuractis bidens* (Retz.) Veldk. ex Tadesse, Kew Bull. 45: 144 (1990). **Type:** India, Bengal, *Koenig* s.n. (holo: LD).

*Bidens tenuifolia* Labill., Sert. austro-caled.: 44, fig. 45 (1825); *Glossogyne tenuifolia* (Labill.) Cass. ex Less., Syn. gen. Compos.: 212 (1832); **Type:** New Caledonia, *Labillardiere* s.n. (holo: FI; iso: P).

*Coreopsis tannensis* Forst. ex Sprengel, Syst. Veg. 3: 614 (1826); *Glossogyne tannensis* (Forst. ex Sprengel) Garnock-Jones, Taxon 35: 125 (1986). **Type:** New Hebrides, Tana Is., *Forster* s.n. (hololecto: K; iso: BM).

*Glossogyne pedunculosa* DC., Prodr. 5: 632 (1836). **Type:** Australia, Queensland, Cape Cleveland, *Cunningham* s.n. (holo: G).

*Glossogyne bidentidea* F. Muell., Linnaea 25: 402 (1852). **Type:** South Australia, Spencer Gulf, in sterile somewhat saline areas, 'spring', *F. v. Mueller* s.n. (holo: MEL).

Leaves mainly basal, alternate, also tufted at the nodes under lateral branches; cauline blades (bi-)pinnatifid, deltoid in outline, 1–4 cm × 5–30 mm. Capitula radiate, 5–8 mm diameter. Involucral bracts straight. Ray florets 5–12, rays up to 5 mm long, 3-lobulate. Disc florets 7–12, 4-merous. Achenes more or less straight, lanceolate in outline, dark brown to black, slightly ribbed, not winged; awns 2, usually more or less erect, sometimes patent, rarely reflexed.

**Distribution and habitat:** Tanzania, India to Korea, Malasia, Australia (Northern Territory, Queensland, New South Wales, Victoria, South Australia), New Caledonia, and Pacific Islands of the Carolines, Fiji, Marianas (Guam, Pagan and Rota). Grows on roadsides; dry slopes in (burnt) grasslands; open savannah; open eucalypt forest; coconut plantations; rocky soil, on limestone crevices, on lava, in clay; apparently mainly along the coast but inland up to 450 (rarely to 1160) m altitude.

**Collector's notes:** Aromatic. Fleshy taproot. Semidecumbent. Leaves greyish green, bright green above, silvery green below. Stems wiry. Flowers fragrant. Ray florets (bright) yellow, golden, orange, or red. Disc florets brown. Young fruits chocolate brown.

**Uses:** In India a preparation of the root is used against bites of snakes, stings of scorpions, and toothaches.

**3. *Glossocardia orthochaeta*** (F. Muell.) Veldk., **comb. nov.**

*Glossogyne orthochaeta* F. Muell., Victoria Naturalist 8: 116 (1891); Bot. Centralbl. 48: 363 (1891). **Type:** Australia, Queensland. COOK DISTRICT: near the South Coen River, A° 1891, *Stephen Johnson* s.n. (holo: MEL).

Probably perennial; roots not seen. Branches said to be radiating, at least the flowering ones erect; branching sympodially. Cauline leaves alternate, close-set, densely imbricate,

ascending, sparsely septate-glandular puberulous, pinnate, the ones on the scape distant, simple. Petioles indistinct from the blade, 2–6.5 cm to the first lobe; cauline blades 4.5–6 × 1.5–2 cm, 3–5-pinnatifid with lobes ascending, linear, sometimes with a small secondary lobe, up to 4.5 cm × 1.2 mm, stiffly herbaceous, 1-nerved; Kranz anatomy indistinct. Capitula solitary on a long, up to 41.5 cm long stalk, radiate, c. 50 mm diameter (when dry). Phyllaries c. 5, resembling the upper scapose leaves, linear-lanceolate, up to 8.0 × 1.5 mm with margins scarious, septate-hairy, gradually acute. Involucral bracts 8–12, more or less in 1 row, ovate-lanceolate, folded back in the middle at anthesis, reflexed against and appressed to the stalk in fruit (still medially folded!), c. 10.0 × 2.5 mm, margins scarious, slightly fimbriately puberulous, and narrowed to the truncate, erose apex, the surfaces striate with minute sparsely set, shortly stalked, capitate glandular hairs on both surfaces, glabrous in fruit. Receptacular bracts decreasing in size inward, ovate-lanceolate (the outer) to oblanceolate, the inner, these c. 7.5 × 1.2 mm. Ray florets female, up to 17, rays c. 15 × 2 mm, 3-lobulate, yellowish (when dry), with 9 purplish nerves, these often covered by small resinous droplets. Disk florets bisexual, fertile, numerous, 4-merous, c. 5 mm long, yellowish (when dry). Achenes homomorph, more or less straight, the apex slightly curving outwards, lanceolate in outline, c. 5.5 × 0.75–1.0 mm, shiny black, ribbed on both sides; awns 2, erect, c. 1 mm long, yellow, hamate, with a small tubercle in between the awns.

**Additional collection examined:** Queensland. COOK DISTRICT: Stannary Hills, 17°19'S, 145°13'E, *Gittins* 528 (NSW, L, fragm.).

**Distribution and habitat:** Australia. Queensland. Cook District. The habitat is not indicated.

**Collector's notes:** Tufted plant, the foliage of the numerous radiating stems forming a hemispherical mass on the ground.

**Notes:** The leaves when boiled exude a reddish fluid, the capitula a yellowish one.

**4. *Glossocardia refracta*** Veldk., *Blumea* 35: 476 (1991). **Type:** Australia, Queensland. COOK DISTRICT: near Granite Creek, c. 12 miles [19.2 km] SSW of Mareeba, 23 April 1967, *Pedley* 2282 (holo: K; iso: BRI, L).

Leaves mainly basal, alternate; blades (bi-)pinnatisect, trullate, up to 4 cm × 30 mm. Capitula radiate, up to 10 mm diameter. Involucral bracts straight. Ray florets c. 5, rays c. 2 mm long, 3-lobulate. Disc florets 10–16, 4-merous. Achenes adaxially strongly involute, lanceolate in outline, black, ribbed, not winged; awns 2, strongly reflexed.

**Additional collections examined:** Queensland. COOK DISTRICT: 8 km NE of Petford on the road to Dimbulah, Jan. 1982, *Clarkson* 4246-B (NSW, BRI); Davies Creek, Mareeba, Apr. 1962, *McKee* 9368 (NSW).

**Distribution and habitat:** Australia. Queensland. Cook District. Grows in low hilly area with *Eucalyptus melanophloia*-*Petalostigma banksii* woodland on shallow stony soil with rocky outcrops; c. 400 m altitude.

**Collector's notes:** Perennial erect herb. Flowers yellow. Rays yellow. Fruits dark brown.

**5. *Trioncinia retroflexa*** (F. Muell.) Veldk., *Blumea* 35: 481 (1991); *Glossogyne retroflexa* F. Muell., *Fragm.* 1: 51 (1858). **Type:** Australia, Queensland, Peak Downs, *F. v. Mueller* s.n. (holo: MEL; iso: K).

Leaves mainly basal, alternate, blades (bi-)pinnatifid, trullate in outline, up to 3.5 × 2.0 cm. Capitula radiate, up to 7 mm diameter. Involucral bracts straight. Ray florets at least 5, c. 3.25 mm long, 2-lobulate. Disc florets 10 or more, 4-merous. Achenes adaxially slightly curved inward, lanceolate in outline, dark brown to black, ribbed, with many warty transverse ridges, not winged; awns 3 or 4, strongly reflexed.

**Distribution and habitat:** Australia. Queensland. 'Peak Downs'; only known from the type (see note). Grows on 'Basaltic plains'.

**Note.** The unknown referee of this paper noted that there is an *S.T. Blake* collection (AQ 414345) of this species in BRI from black soil at Blair Athol (16 March 1935), 22°4'S, 147°3'E.

**Reference**

VELDKAMP, J.F. & KREFFER, L.A. (1991). Notes on Southeast Asian and Australian Coreopsidinae (Asteraceae). *Blumea* 35: 459-482.

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